
INTERNATIONAL BULLETIN

OF PLANT PROTECTION

DISCOVERIES AND CURRENT EVENTS *

Algeria : Swarms of Desert Locust and Moroccan Locust (1).

Some small swarms of desert locusts (*Schistocerca gregaria*) were seen on the 4 July 1929 at 40 km. from Colomb-Béchar flying towards the North-East.

A swarm of slight importance was reported on the 12 July at Ouendoura (M. C. of Khenchela) coming from the South and flying towards the East.

A fairly considerable swarm coming from the South was seen on the 20 July over Laghouat; the swarm, which alighted on the Zouaïmou oasis, has flown away towards the North East.

A swarm of red locusts passed over Reibell (M. C. of Chellala) on the 30 July flying towards the North.

A swarm of red locusts passed over Chabounia, 45 km. from Boghari, on the 31 July, flying towards the North.

Some swarms of Moroccan locusts (*Docostaurus maroccanus*) have again been seen in the Department of Constantine, during July, over the Mixed Communes of Aïn El Ksar, Aurès, Barika, Eulmas, Bibans, Rihras, M'Sila, Périgotville and Aïn Tagrout, and the Communes of Sétif, Tocqueville and Coligny Pleinexercice.

Germany : Most Important Diseases and Pests Occurring between January and May 1929 (2).

As the result of the severe winter the most various kinds of plants in all part of the Reich suffered from the effects of frost. In May in many neighbourhoods early vegetables and potatoes, as well as the fruit blossom, were badly cut by the night frosts, and in some neighbourhoods there was damage from hail. In the same month there were complaints in various districts of damage through drought, particularly among cereals and fodder crops.

In many districts the cereals were severely affected by damage due to the winter and to *Fusarium*. In North Germany especially wheat and rye were attacked by "wheat bulb fly" (*Hylemyia coarctata*). Yellow rust (*Puccinia glumarum*) was increasingly noticeable in May.

* In this, as in the two next chapters, the countries are arranged in French alphabetical order.

(1) Communication from the Governor General of Algeria to the International Institute of Agriculture.

(2) Communication from the Biologische Reichsanstalt für Land-und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

Sugar beet and mangolds were attacked in May repeatedly by beet fly (*Pegomya hyoscyami*) and by *Blitophaga* sp.

Clover and fodder grasses showed severe winter damage and clover rot (*Sclerotinia Trifoliorum*) frequently appeared.

Rape stood the winter well. Young vegetables and cabbage plants were severely attacked by flea beetles (*Phyllotreta* sp.), the cabbage root maggot (*Phorbia brassicae*), and pulse by *Sitona* sp.

Damage from *Monilia* appeared frequently on cherry trees. Stone fruit suffered from caterpillars. Voles (*Arvicola terrestris*) did much damage in the orchards. *Puccinia Pringsheimiana* was often observed on the gooseberries. *Anthonomus rubi* did much mischief in many neighbourhoods to strawberries.

Oaks and other shade trees suffered severely from the ravages of *Tortricidae*, *Geometridae* and *Bombycidae*. Pupae of the pine moth (*Bupalus pinarius*) were found in great numbers in some neighbourhoods.

There were no new diseases or pests.

Italy: Insects Injurious to Various Plants (I).

Certain insect invasions are worthy of notice owing to the unusual extent of the injuries which they have caused to plants in the territorial limits of the Royal Phytopathological Observatory of Turin.

In the Cuneo and Pinerolo regions, extensive chestnut plantations and many forest trees as well as some fruit trees have had their foliage almost completely destroyed by innumerable caterpillars of the Gypsy Moth (*Lymantria dispar*). In view of the already almost mature condition of the larvae, it was not possible to recommend anything except the destruction of eggs, which had already been laid in some places.

Many vineyards in various hilly regions have been invaded by a large number of *Anomala vitis*, which by destroying almost all the foliage, have caused an abnormal growth, which has considerably exhausted the vines and reacted on the growth and maturation of the grapes. By way of control the collection of the insects in the early hours of the morning has been recommended and as an experiment dusting with alkaline arsenites mixed with talc (40 % of the former and 60 % of the latter) has been suggested in a locality near Turin.

This same *Anomala* has also damaged fields of maize, attacking by preference the panicles, but passing also on to willows and fruit trees growing round the infested fields, destroying their foliage. Walnut leaves were also eaten by them.

In some marshy meadows of the Novara district, an invasion of *Chorthippus albomarginatus* has been reported over an area of several hectares and has caused loss of hay.

Rose bushes were so heavily infested with *Hylotoma rosae* that they were almost bared of leaves.

Cultivated cruciferous plants, particularly cabbages, have been damaged by very numerous punctures of *Eurydema ornata*. The allied species *Murgantia histrionica* is also almost always present.

This year the attacks of *Eriophyes vitis* on the vine leaves, causing weakening of the vines, has assumed unusual gravity. Also *E. pyri* has caused extensive foliar disfigurement, now increased by that caused by *Stephanitis pyri*.

(1) Communication from the Royal Phytopathological Observatory at Turin, transmitted by the Royal Station of Plant Pathology at Rome, official correspondent of the Institute.

On peach and pear trees and on broadleaved trees, especially the lime, *Tetranychus telarius* has been the cause of an extensive withering of the leaves with subsequent defoliation.

Among the pests of vines *Polychrosis botrana* is commonest in the plains; towards the middle of July, pupae of the first generation had already been found in small emptied grapes.

The following were also common:— *Schizoneura lanigera* on the leaves of elms; *Eriophyes salicis* on the female catkins and *Pontania vesicator* on the leaves of willows. Branches of willows were deeply disfigured by *Rhabdophaga saliciperda*, an insect uncommon in these regions.

Rumania: Outbreak of the Bacterial Disease of Tobacco, known as 'Wisconsin Leaf Spot' (1).

In the tobacco plantations in the valley of the Danube, on 9 June this year, an affection of the leaves made its appearance, which we identified as the 'Wisconsin Leaf Spot' described by JOHNSON in 1923 in America. We have isolated the causal agent and made an exhaustive study of it and the disease. Our most important observations may be summarised as follows:—

(1) The outbreak is of a somewhat serious nature, causing losses of 40 to 100 per cent.

(2) The best varieties, such as 'Yaka' and 'Suluk' (= acclimatised 'Yaka') were most severely infected; other varieties, such as 'Ghimpatzi' and 'Herzegovina' were more resistant.

(3) Humidity and temperature have an important influence on the outbreak and spread of the disease.

(4) Primary infection takes place in the seed bed and infection in the field is only a secondary result of the former.

(5) The bacteria are found in the intercellular spaces as well as within the cells.

(6) The organism has been identified as *Bacterium melleum* John. but it occurs in a much more virulent physiological strain than the American form.

(7) The disease has also been observed on wild Solanaceous plants, e. g. *Datura Stramonium*, in the neighbourhood of the plantations.

(8) Our inoculations of various cultivated varieties of tobacco, various species of *Nicotiana* and various genera and species of Solanaceae have all caused infection. We have also infected many other plants belonging to different families, so that the possibilities of infection are shown to be various. In particular, members of the Cucurbitaceae, Scrophulariaceae, Papilionaceae, Convolvulaceae, Caryophyllaceae, Cruciferae and Compositae have been readily infected by inoculation. This shows that the pathogeneity of *Bact. melleum* is not strictly specific.

(9) Successful experimental infection has been achieved not only with puncture inoculations but also by spraying the leaves with a suspension of the bacterium.

(10) It is not essential for natural infection that the leaves should be injured. Direct contact of the leaves of seedlings with infected soil is sufficient.

(1) Communication from the official correspondent to the Institute, Prof. Dr. Tr. SAVULESCU, Director of the Central Phytopathological Station at Bucharest.

(11) Treatment of the soil and seeds with various chemicals has given satisfactory results.

(12) The most important preventive measures are disinfection of the seed beds and the tools used, transplanting thoroughly healthy seedlings and destroying diseased leaves in the field.

Switzerland: Outbreak of the Bean Bruchid (1).

The Bean Bruchid (*Acanthoscelides obtectus* Say) which had been till now unknown in Switzerland, has been recently observed at Lausanne, where it has done much damage to a reserve of seeds. The insect has probably been introduced with seeds imported from France. It is not so far known if this pest has appeared in other parts of French Switzerland.

VARIOUS QUESTIONS

DATA AND INFORMATION ON DAMAGE CAUSED TO CULTIVATED CROPS BY THE COLD OF THE WINTER 1928-1929.*

Germany (1). — The coldest days of the 1928-29 winter were recorded during the month of February. According to the data collected by the Meteorological Institute in Berlin the following minimum temperatures were registered during that month:—

Königsberg	—31°.2 C.	Breslau	—32° 0 C.	Kassel	—23° 1 C°
Osterode	—31° 5	Ratibor	—35° 8	Köln	—16° 7
Deutsch-Krone . . .	—29° 5	Magdeburg	—25° 7	Frankfurt a. M. . .	—21° 5
Köslin	—28° 4	Erfurt	—38° 4	Würzburg	—23° 0
Stettin	—26° 5	Hanover	—25° 0	München	—31° 6
Berlin	—26° 0	Flensburg	—17° 0	Stuttgart	—23° 5
Frankfurt a. O . . .	—31° 2	Neumunster	—21° 4	Dresden	—27° 8
Görlitz	—28° 5	Munster	—20° 1	Karlsruhe	—23° 1

With regard to the susceptibility of different genera of crop plants it is noteworthy that rye was little affected. The same cannot be said of wheat, of which several varieties proved resistant while others were seriously damaged. Practically no difference was found between the different varieties of autumn barley and oats with regard to their resistance to cold; they were damaged almost everywhere. The same applies to clover, lucerne, meadow plants and for the most part also to rape. Damage to fruit trees varied greatly according to the variety. Certain

(1) Communication from the official correspondent to the Institute, Dr. H. FAES, Director of the Federal Viticultural Experiment Station at Lausanne (Montagibert).

* Continued from No. 9.

(1) Communication from the Biologische Reichsanstalt für Land- und Forstwirtschaft, Berlin-Dahlem, official correspondent of the Institute.

varieties of apples in particular suffered very little all over Germany, while on the other hand no varieties of pears have shown a similar resistance. The late varieties of cherries and sour cherries in general suffered less than the early varieties. The following table gives more precise indications of the susceptibility to cold of various varieties and species of crop plants.

Resistant	Non resistant	Resistant	Non resistant
CEREALS.		Cherries.	
Autumn Wheat.		Late cherries and sour cherries little damaged	
General v. Stocken	Dikkopf	Fruheste der Mark Grosse Herzkirschen	
Panzerweizen	Wilhelminen		
Criewener 104	Rimpaus fr. Bastard		
Standard	Siegerländer		
Carstens 5		ORNAMENTAL TREES.	
Autumn Barley.		<i>Juglans nigra</i>	<i>Juglans regia</i>
Peragis (partly)	Nearly all varieties	<i>Pinus sylvestris</i>	<i>Castanea sativa</i>
Friedrichswerther (partly)		» <i>Banksiana</i>	<i>Morus nigra</i>
Autumn Oats.		» <i>nigra</i>	» <i>alba</i>
	Nearly all varieties	» <i>excelsa</i> *	<i>Sequoia gigantea</i> **
CLOVER AND MEADOW PLANTS.		» <i>Strobilus</i>	<i>Cryptomeria japonica</i>
	Red clover	» <i>montana</i>	<i>Taxodium distichum</i> **
	Crimson clover	» <i>Cembra</i>	<i>Libocedrus decurrens</i>
	Ray-grass	<i>Sciadopitys verticillata</i>	<i>Cedrus Libani</i>
FRUIT TREES.		<i>Thujaopsis dolabrata</i>	» <i>atlantica</i>
Apples.		<i>Torreya californica</i>	» <i>Deodara</i>
Charlamowsky	Casseler Pippin	<i>Taxus baccata</i> *	<i>Cephalotaxus Fortunei</i>
Weisser Klaraapfel	Cox's Orange Pippin	<i>Tsuga canadensis</i>	» <i>drupacea</i>
Bohnäpfel	Goldparmäne	<i>Pseudotsuga</i> *	<i>Tsuga Mertensiana</i>
Ribston Pippin	Baumanns Pippin	<i>Chamaecyparis thuyoides</i> =	<i>Larix europaea</i>
Prinzenäpfel	Gravensteiner	» <i>sphaeroidea</i>	» <i>leptolepis</i>
Schöner v. Boskoop	Jakob Lebel	<i>Cham. andelyensis</i>	» <i>kurilensis</i>
(partly)	Gelber Richard	» <i>nukaensis</i>	<i>Abies</i>
	Schöner v. Boskoop	<i>Ginkgo biloba</i>	<i>Chamaecyparis obtusa</i>
			» <i>Lawsoniana</i>
			<i>Chamaecyparis pisifera</i>

* Variable. — ** Beginning to bud again.

Amongst the plums the varieties Grosse grüne Reineclaude, Kirkes Pflaume and Wangenheim's Frühzwetsche in East Prussia were little damaged in comparison with other varieties.

The following table shows the extent and severity of the damage caused by the cold in different parts of Germany.

The cold is reported to have caused serious damage to box, thuja and yew, particularly in Hanover, Schleswig Holstein, East Prussia and Hesse-Nassau.

In certain places Weymouth pines and Douglas firs have been seriously damaged. Exotic conifers in general have suffered much in Hanover, Saxony and Brunswick; similarly ivy, rhododendrons and roses in Hanover, Oldenburg, Grenzmark, Saxony and Westphalia. Even oaks have been slightly damaged in certain parts of Saxony, Grenzmark and Hanover.

Province or Region	Percentage injury to potatoes * stored in silos		Area re-sown on account of winter damage in % of total planted area					Winter injury to fruit trees **					
	1929	1928	Rye	Wheat	Barley	Clover	Lu-cerne	Apples	Pears	Cher-ries	Plums	Pea-ches	Vines
East Prussia	13.6	3.2	10.22	5.13	31.76	1.37	7.82	4	5	4	4	5	—
Grenzmark	11.3	4.9	0.12	0.61	10.34	1.56	0.33	4	4	4	4	5	4-5
Pomerania	12.2	4.3	0.60	0.79	10.85	0.32	0.46	—	—	—	—	—	—
Brandenburg	15.0	4.4	0.14	0.22	2.29	0.16	0.28	—	—	—	—	—	—
Lower Silesia	10.2	5.2	0.50	1.39	14.97	0.94	0.65	4	4	4	4	5	4
Upper Silesia	7.4	1.5	0.73	1.56	6.55	0.85	2.07	—	—	—	—	—	—
Saxony (prov.)	14.0	5.6	0.36	1.63	9.92	1.54	0.37	4	4	5	—	5	—
Hanover	21.2	1.9	0.92	15.63	28.36	8.92	7.97	—	—	—	—	—	—
Schleswig-Holstein	20.7	1.1	0.16	13.81	14.22	0.73	—	—	3	—	—	4	—
Westphalia	13.5	0.8	2.40	28.8	48.77	21.35	16.59	—	—	—	—	—	—
Hesse-Nassau	16.0	3.4	0.36	1.20	9.81	0.6	0.5	—	—	3	—	—	—
Rhineland	9.5	3.5	3.34	30.97	42.83	28.37	22.50	—	—	—	—	—	—
Bavaria	10.3	6.0	2.44	3.12	8.03	2.60	2.90	3	3	4	4	5	—
Wurtemberg	16.0	0.5	5.1	3.33	6.0	5.62	1.35	4	5	4	4	—	4
Saxony (Free State)	9.2	1.4	1.0	0.9	1.4	4.8	1.06	3-4	3-4	3-4	4	4-5	4
Baden	16.5	0.5	0.6	2.4	1.8	1.9	0.1	—	5	—	—	4	4
Thuringia	13.3	10.4	0.3	0.6	1.5	1.4	0.3	—	4	—	—	—	5
Mecklenburg	17.9	5.2	0.45	1.15	6.25	2.65	0.15	5	4	—	4	4	—
Oldenburg	21.2	4.6	0.79	2.4	29.21	—	—	2	—	—	4	5	—
Hesse	11.4	1.0	0.2	1.6	0.7	0.2	1.2	—	—	—	—	—	—
Average for the whole of Germany 1929	13.4	—	1.8	6.3	18.3	4.5	2.7	—	—	—	—	—	—
Average for the whole of Germany 1928	—	3.2	3.5	2.5	3.7	2.0	2.9	—	—	—	—	—	—

* The cold damaged potatoes stored in cellars more seriously than those in silos. — ** Damage: 1 = nil, 2 = very slight, 3 = slight, 4 = serious, 5 = very serious.

Although for the most part it was only the aerial parts of bush fruits and ornamental plants which were affected, the roots or bulbs were also in some cases damaged.

The severity of the damage depended mainly on the depth of snow, which made it difficult to determine the influence of different types of soil. Other conditions being equal plants have suffered more on light soils than on clays.

The visible damage caused by the cold was variable, and was particularly serious on fruit trees and forest trees. In most cases splits developed in the trunks which closed again later. The leaves of Conifers and other evergreens turned brown. The roots of vines and ornamental plants often decayed.

In several cases it was observed that trees damaged by the frost flowered normally and then lost their flowers and leaves and withered. Frequently branches of sour cherries which were seriously injured bore a normal quantity of young fruits.

It is not yet possible to estimate definitely the extent of the losses because the reports received are still incomplete. In the report on crop pests and diseases during 1929, which will probably be published in the spring of 1930, a detailed account will be given of the damage to crops in Germany caused by the 1928-29 winter.

Italy (I). — In January 1929 an unusual degree of cold was recorded in the province of Triest, reaching minima below 0°C. On 17 January — 3° and — 8° were recorded. The monthly average was thus lowered from 4.3° to 2°. The

'bora' blew on the 8th and 26th with a velocity of over 50 km. an hour. There were in all 215 hours of 'bora' during the month.

In February the cold exceeded any that had previously been recorded. The Gulf of Triest suffered from frost and violent winds. There were 22 days on which the temperature was below 0°, lasting as long as 380 hours. On the 11th the temperature reached a minimum of -14.3° C. The monthly average was reduced from 5.3° to -1.7°. The 'bora' blew for 216 hours during February, with a velocity of over 50 km. an hour. At 10 p. m. on 28 February the squalls reached a velocity of 145 km. per hour.

The ground was frozen to the unusual depth of over 50 cm.

The aerial parts of olive trees were completely destroyed. The roots of the old trees were also killed. The losses caused in the olive yards were enormous and will be felt for many years. Old vines in exposed and damp places also suffered: over 4 % loss may be expected.

The aerial parts of fig trees appeared to have been killed but have budded again everywhere.

Numbers of fruit trees, particularly those which were damaged, were entirely or partially killed, in all 2 %. Potatoes were frosted in the most weatherproof, but unheated, stores. Capers were killed everywhere. Most of the aerial parts but few stocks of laurels were completely killed. Japanese medlars lost their leaves, but few perished. Agaves were killed in unheated glasshouses. The greater number of palms in the open perished. Cabbages and cauliflowers were universally killed; cereals which were not covered with snow perished. Marjoram and most of the rosemary and pittosporum perished; branches of cypresses were killed, but spindle proved resistant.

LEGISLATIVE AND ADMINISTRATIVE MEASURES

Canada. — By Order in Council C. P. 1146 of 2 July 1929 Regulation No. 4 (foreign), 1st revision, prescribed by Order in Council C. P. 717 of 20 April 1927, has been withdrawn and replaced by Regulation No. 4 (foreign), 2nd revision, of which the text is as follows:—

The importation into the Dominion of Canada of all plants, non canned fruits or other plant products, coming directly or indirectly, from the Hawaiian Islands and the State of Florida of the United States of America, is prohibited unless such importations are accompanied by a certificate issued by an authorized officer of the United States Department of Agriculture to the effect that the contents of the shipment originated in a district known to be free from infestation by the Mediterranean fruit fly [*Ceratitidis capitata*]. The original certificate shall accompany the shipping papers and a copy certificate shall be attached to each container.

It is understood, however, that the fruits of pineapple (*Ananas sativus* Schult.), banana (*Musa sapientum* L.) and coconut (*Cocos nucifera* L.) may be imported from the Hawaiian Islands when accompanied by a certificate of inspection issued by an authorized officer of the United States Department of Agriculture, certifying freedom from infestation by the Mediterranean fruit fly. (*The Canada Gazette*, Ottawa, July 13, 1929, Vol. LXIII, No. 2, pp. 243-244).

France. — The Ministerial Decree of 30 April 1929 distributes among the twenty-seven phytopathological divisions the horticultural and viticultural establishments, also those for the exportation of agricultural products of plant origin, registered for 1929 on the lists for control by the Phytopathological Service, and indicates the inspectors, delegates, deputy delegates and controllers for the year 1929. (*Journal officiel de la République Française*, Paris, 2 août 1929, LXI^{ème} année, n° 180, p. 8802-8805).

Italy. — By reason of the presence of grape phylloxera [*Phylloxera vastatrix*] within the Communes of Moliše, Castelpetroso, San Biase, San'Angelo Limosano (province of Campobasso) and Cerretto Langhe (province of Cuneo) by Ministerial Decrees of 3 September 1929, the regulations contained in art. 6 of the Law No. 94 of 3 January 1929 (see this *Bulletin*, 1929, No. 2, pp. 23-24) have been extended to these Communes. The same measure has been taken by Ministerial Decree of 5 September 1929 with regard to the territory of the Commune of Ascoli Piceno. (*Gazzetta ufficiale del Regno d'Italia*, Roma, 9 settembre 1929, anno 70°, n. 210, p. 4114).

Mexico. — The 'Cuarentena núm. 1' of 16 April 1929, which came in force 16 May following, details the regulations to be observed in the interior of the country with the object of avoiding the propagation of the pink bollworm ('gusano rosado del algodónero', *Pectinophora gossypiella*). Four 'zonas de control' are instituted in the country and arrangements for regulating the movement of cotton or its products inside and outside these zones are provided for, as well as precautions regarding means of transport used or to be used, depots of industrial products of cotton, seed control measures against the insect to be applied in the cultivation and ginning of cotton, etc. (*Diario Oficial*, México, 16 de mayo de 1929, tomo LIV, núm 13, págs. 2 a 4).

* * The regulation of the 'Juntas de Defensa Agrícola' subordinate to the 'Oficina Federal para la Defensa Agrícola' published on 26 April 1929, provides that the 'Secretaría de Agricultura y Fomento' through the above-mentioned 'Oficina' will institute in each Municipality or any other place considered suitable, a permanent 'Junta' including a president, a secretary and a treasurer, all being of an honorary character, chosen from among farmers or persons concerned in agriculture, of any nationality, provided that they are domiciled in or are farming in the district of the respective 'Junta'.

The latter will be the intermediary between the farmers of the district and the 'Oficina', intended to make known and to apply the instructions and arrangements regarding the prevention and control of diseases and pests of crops; it will also furnish to the 'Oficina' information asked for by the latter; will notify to it the appearance of new crop diseases or pests within the limits of the district; will report periodically regarding the state of diseases and pests where they already exist; will extend propaganda and popularizing activities among farmers.

Whenever a disease or pest of a serious kind is discovered in the district, the 'Junta', having obtained authorization from the 'Oficina', will proceed to collect funds from the farmers and to take other measures which should serve exclusively to render control more rapid and effective.

The members of the 'Junta' will enjoy, in addition to the privileges and exemptions granted to federal officials, also postal and telegraphic privileges; they will also receive *gratis* the publications of the 'Oficina'. The latter will give to mem-

bers, who distinguish themselves particularly in the exercise of their duties, honourable mention and other rewards. (*Ibid.*, 4 de mayo 1929, núm. 3, págs. 2 y 3).

* * With the object of preventing the introduction into Mexico of the Mediterranean fruit fly ('mosca de la fruta del Mediterráneo', *Ceratitis capitata*), by 'acuerdo' of 27 April 1929, coming into force 24 May following, has been absolutely prohibited the importation of all kinds of soft fruits or of vegetables, as well as their respective plants, coming from the following countries:— the Azores, Spain, Algeria, Italy, Tunisia, South Africa, Australia, Tasmania, France, New Zealand, Brazil, Egypt, Asiatic Turkey, Argentina, West Africa, Madagascar, Greece, Bermuda, Hawaiian Islands and Florida.

The present provision modifies article 1 of the 'Cuarentena exterior núm. 5' of 17 July 1927. (*Ibid.*, 24 de mayo de 1929, núm. 20, pág. 2).

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[*Plasmopara viticola*].

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[*Bacterium vascularum*, *Bacterium* sp., *Phytomonas rubrilineans*, 'Mosaic' (disease due to a virus), 'Streak disease' (idem), 'Fiji disease' (idem), 'Sereh' (cause unknown), *Fusarium moniliforme*, *Ustilago scitaminea* (U. *Sacchari*), 'Tangle top' (due to a mechanical cause), 'Lightning injury', *Sclerospora Sacchari*, *Helmintosporium Sacchari*, *Puccinia Kuehnii*, *Leptosphaeria Sacchari*, *Mycelia sterilia*, *Cercospora longipes*, C. *Kopkei*, *Eriosphaeria Sacchari*, 'Manganese chlorosis', 'Leaf variegation', 'Sectional chlorosis' (due to environmental factors), *Melanconium Ilium*, *Sclerotium Rolfsii*, *Cerc. vaginae*, *Colletotrichum falcatum*, *Cephalosporium Sac-*

chari, *Hendersonina Sacchari*, *Thielaviopsis paradoxa*, *Pleocyla Sacchari* (*Melanconium Sacchari*), 'Stem gall disease' (cause undetermined), *Aeginetia indica*, *Striga* spp., *Pythium* sp., *Marasmius* sp., *Plasmodiophora vascularum*, *Tylenchus similis*, *Heterodera radicola*, *H. schachtii*, 'Macrofauna injury to roots', 'Growth failure due to unfavourable base ratio', 'Aluminium toxicity', 'Salt injury'.

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[*Fusarium* sp.].

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[This insect previously unknown in Switzerland has been recently reported at Lausanne where it has done very considerable damage].

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[*Cecidomyia* sp., *Aspergillus* sp.].

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[*Clysia ambiguella*, *Polychrosis botrana*].

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[*Sturnus vulgaris*. This bird is far more useful than harmful to agriculture].

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[*Plasmopara viticola*, *Coniothyrium Diplodiella*, *Conchyliis ambiguella*, *Polychrosis botrana*, *Tortrix pilleriana*, etc.].

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[*Cephus pygmaeus* L.].

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[On *Cyperus Papyrus* at Syracuse a Protozoon has been observed presumably to be referred to the genus *Leptomonas* or *Crithidia*].

PETRI, L. Sulle cause dell'arricciamento della vite. *Bollettino della R. Stazione di Patologia vegetale* [di Roma], Firenze, 1929, anno IX, nuova ser., n. 2, pp. 101-130, figg. 1-7.

[Investigations up to the present reinforce the supposition that the 'arricciamento' ('court-noué', 'roncet', 'Krautern', 'Reisigkrankheit') is a virus disease].

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[*Polyphylla olivieri* L. a vine pest].

RIVERA, V. Influenza del trattamento di tubi di emanazione sopra lo sviluppo di alcuni microrganismi vegetali. *Bollettino della R. Stazione di Patologia vegetale* [di Roma], Firenze, 1929, anno IX, nuova ser., n. 2, pp. 241-247, figg. 1-2.

[*Bacterium tumefaciens*, *Bact. fluorescens*].

RIVERA, V. Rassegna dei casi fitopatologici osservati nel 1928 nel Laboratorio ed Osservatorio di Patologia Vegetale presso il R. Istituto Superiore Agrario di Perugia. *Bollettino della R. Stazione di Patologia vegetale* [di Roma], Firenze, 1929, anno IX, nuova ser., n. 2, pp. 131-163, figg. 1-6.

NOTES

Recommendations and Resolutions of the XIVth International Agricultural Congress (Bucharest, 1929). — The Congress considers it advisable to:—

(1) Invite the States which have not yet a phytopathological organisation to take steps to form one, and to invite those in which the organisation is incomplete to perfect it. (2) Invite the States which have a phytopathological organisation to adhere to the International Convention for Plant Protection in the form finally drawn up in Rome [see this *Bulletin*, 1929, No. 4, pp. 50-55]. (3) Establish a central organisation of reference for publications of a phytopathological nature, which will act in connection, collaboration and coordination with the International Institute of Agriculture in Rome, in order that publications of practical value may be made known by means of the *International Bulletin of Plant Protection* and that the bibliographical list published by this *Bulletin* may always be complete. This central organisation shall be the spokesman of the International Association of Phytopathologists, the programme of which shall be drawn up by the next International Phytopathological Congress. (4) Establish a regular exchange of publications between the States through the Central Exchange Offices which will be formed in each country. (5) Encourage more ac-

tively than has been done hitherto the interchange of specialists. (5) Invite the States to further as far as is possible the compulsory disinfection of cereal seeds.

The Congress strongly recommends as follows:—

(A) Agronomical study of cereal 'rusts'. — (1) In each country or region the species and physiological forms of 'rusts' which attack the cereals will be accurately determined. It is known that the behaviour of species depends on climatic conditions and on the sorts of cereal cultivated. (2) The frequency and the intensity of development of the various species of 'rust' will be determined in relation to the different kinds of cereal, particularly for wheat. For this purpose one of the usual methods of recording will be used, such as the coefficient method of Ducomet and Poëx or Haves and Stakman. (3) A scale of the resistance and susceptibility to 'rust' of the various types of cereal grown will be drawn up in each district. (4) The varying susceptibility of cereals at different stages of their development in relation to 'rust' will be studied. (5) The relation between early or late maturing of cereals and their susceptibility to various species and special forms of 'rust'.

(B) Ecological study of cereal 'rusts'. — (1) The influence of climatic and meteorological conditions, such as temperature, rainfall, atmospheric humidity and wind, on the outbreak or development of 'rusts' will be determined simultaneously in different localities. (2) A map will be drawn up showing the distribution in each country of the various species of 'rust' in relation to climatic and meteorological conditions. (3) The degree of specialisation of the different species of 'rust' to the various varieties and pure strains of cereals. (4) The manner of wintering of the 'rusts' will be determined. (5) The relation between the frequency of 'rust' and that of the hosts of the aecidium stage will be determined. (6) To recommend the States to set about the extermination of *Berberis vulgaris* and *Rhamnus cathartica*. (7) The agronomical and ecological studies suggested in the preceding paragraphs will be coordinated with the ecological study of cereals carried out by the International Commission of Ecology and Genetics at the International Institute of Agriculture, with a view to a centralisation of use to all countries.

(C) Genetical study of cereal 'rusts'. — By collaboration between phytopathologists and geneticists the selection of pure strains and hybrids resistant to 'rusts' will be attempted. For this purpose Regional Selecting Stations will have to be formed in the important agricultural countries.

(D) Physiological study of cereal 'rusts'. — The influence of nutritive factors on the susceptibility of cereals in relation to 'rust' will be studied. In the same connection, the degree of frequency and intensity of 'rust' in different districts will be compared with the different classes of soil and fertilisers.

(E) Study of the treatment of cereal 'rusts'. — (1) Trial of treatment with slightly hypertonic solutions. (2) Application of sulphur treatment.

(F) Co-ordination of the work of different countries. — It will be possible for each year's results to be collected, compared and analysed by a general reporter, who will draw conclusions and thus give an opinion on the direction to be followed in further work. These deductions will also be made known by the International Institute of Agriculture by means of the *International Bulletin of Plant Protection*.